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IO-13 L-03 NSF-04 NSC-10 NSAE-00 PM-07 RSC-01 SCI-06

SS-15 AEC-11 SCEM-02 INT-08 PA-03 PRS-01 USIA-12

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R 121630Z JUL 73
FM USMISSION NATO
TO SECSTATE WASHDC 801
INFO ALL NATO CAPITALS 3120
AMEMBASSY CANBERRA
AMEMBASSY TEL AVIV
AMEMBASSY TOKYO
AMEMBASSY WELLINGTON
USMISSION EC BRUSSELS

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WHITE HOUSE FOR TRAIN

ROME TAKE FOR ACTION

E.O. 11652: N/A
TAGS: SENV, NATO
SUBJ: CCMS SOLAR ENERGY MEETING, JULY 11, AT NATO HEADQUARTERS

SUMMARY. SEVENTEEN REPRESENTATIVES FROM NINE COUNTRIES (BELGIUM, FRANCE, FRG, GREECE, TURKEY, NETHERLANDS, PORTUGAL, UK AND US) MET AT NATO HEADQUARTERS JULY 11 TO DISCUSS US PROPOSAL FOR CCMS COOPERATIVE PROJECT ON SOLAR ENERGY HEATING AND COLLING SYSTEMS FOR BUILDINGS. MEETING WAS CHAIRED BY MR. RICHARD GREEN, (DEPUTY ASSISTANCE DIRECTOR UNCLASSIFIED

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OF RESEARCH APPLICATIONS, NSF) AND BEGAN WITH US PRESENTATIONS BY NSF OFFICIALS INCLUDING A.J. EGGERS (DIRECTOR OF RESEARCH APPLIATIONS, NSF). MEETING CONCLUDED WITH AGREEMENT ON TEXT

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OF CCMS SOLAR PROJECT PROPOSAL WHICH WOULD BE RECOMMENDED TO THE GOVERNMENTS CONCERNED FOR SUBMISSION TO THE CCMS PLENARY IN OCTOBER 1973. PROJECT PROPOSAL REMAINS ESSENTIALLY THAT CIRCULATED BY US WITH A FEW MINOR EDITORIAL CHANGES. (TEXT BEING TRANSMITTED SEPTEL.) IN ADDITION, US CIRCULATED INITIAL DRAFT OF REPORTING FORMAT FOR SUBMISSION OF INFORMATION ON EXISTING SOLAR ENERGY SYSTEMS IN ACCORDANCE WITH PHASE 1 OF PROJECT. DELEGATES PRESENT WERE GENERALLY ENTHUSIASTIC AND EXPECT THEIR GOVERNMENTS' SUPPORT FOR OVERALL CCMS PROJECT IN THE SOLAR HEATING AND COOLING OF BUILDINGS.

HIGHLIGHTS INCLUDED GREEK DESCRITPION OF ADVANCED PILOT PLANT FOR SOLAR DISTILLATION WHICH MIGHT ALSO BECOME PART OF CCMS PROJECT. GREECE CURRENTLY HAS IN OPERATION FIVE SOLAR DISTILLATION PLANTS, ONE OF WHICH THEY CLAIM IS LARGEST IN EUROPE. FRANCE IS CLEARLY MOST DEVELOPED EUROPEAN COUNTRY IN THIS AREA, AND REPORTS CONSTRUCTION OF THREE NEW HOUSES CONTAINING SOLAR HEATING AND COLLING SYSTEMS ON WHICH FRANCE WOULD BE WILLING TO EXCHANGE INFORMATIONAS PART OF CCMS PROJECT. PORTUGAL, UK, AND GERMANY INDICATED INTEREST IN IMPROVED USE OF SOLAR ENERGY AS IMPORTANT COMPONENT OF IMPROVED ENERGY UTILIZATION IN PRIVATE AND PUBLIC BUILDINGS.

END SUMMARY.

1. CCMS SOLAR ENERGY MEETING OPENED WITH AGREEMENT ON FOLLOWING AGENDA:

A. INTRODUCTION BY MR. GREEN. (NSF)

B. OBJECTIVES OF CCMS BY MR. SPIELMAN (NATO SECRETARIAT)

C. STATEMENT BY DUTCH DELEGATE TO NATO REGARDING UNCLASSIFIED

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SUPPORT OF SOLAR ENERGY PROJECT.

D. SUMMARY OF US ENERGY PROGRAM-ENERGY AND NATURAL RESOURCES DEPARTMENT AND ENERGY RESEARCH DEVELOPMENT ADMINISTRATION BY MR. GAGE. (CEQ)

E. OVERVIEW OF US SOLAR ENERGY PROGRAM BY DR. EGGERS. (NSF)

F. TECHNICAL ASPECTS OF US SOLAR ENERGY PROGRAM BY DR. HERWIG. (NSF)

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G. SOLAR HEATING AND COOLING OF BUILDINGS BY
MR. FIELDS. (NSF)

H. NATO COUNTRIES SOLAR ENERGY PROGRAMS.

I. DISCUSSION OF PROPOSED CCMS SOLAR ENERGY
PROJECT LED BY MR. GREEN AND MR. HODSOLL
(WHITE HOUSE)

2. FOLLOWING WELCOME BY GREEN AND SPIELMAN
PRESENTATION, MR. DOLLEMAN NETHERLANDS POINTED OUT HIS
COUNTRY'S INTEREST IN WIND ENERGY AND EXPRESSED HIS
SUPPORT FOR CCMS SOLAR ENERGY PROJECT. DOLLEMAN
STATED THAT COOPERATION IN THIS AREA WAS NOT REPEAT
NOT TAKING PLACE ELSEWHERE.

E. GAGE (CEQ) DESCRIBED RECENT DEVELOPMENTS IN US
ENERGY POLICY AND EXPLAINED RELATION OF NSF SUPPORT
OF R&D IN ADVANCED ENERGY SYSTEMS TO OVERALL US
ENERGY PROGRAM. HE MENTIONED PRESIDENTIAL ENERGY
MESSAGES OF APRIL 18 AND JUNE 29, 1973, INCLUDING
PROPOSALS FOR NEW DEPARTMENT OF ENERGY AND NATURAL
RESOURCES AND ENERGY RESEARCH AND DEVELOPMENT
ADMINISTRATION. GAGE EXPLAINED POTENTIAL IMPACT
OF PROPOSED REORGANIZATION ON DEPARTMENT OF INTERIOR,
AEC AND NSF, INDICATING CONTRINUATION OF NSF LEAD
ROLE IN SOLAR ENERGY R&D. GAGE ALSO DESCRIBED
LINKAGE OF THREE US-PROPOSED ENERGY PROJECTS.
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4. DR. EGGERS DESCRIBED GENERAL SCOPE OF
US PROGRAM IN SOLAR ENERGY WITH PARTICULAR
EMPHASIS ON THE AREAS WHICH WILL BE BROUGHT TO
THE PROOF OF CONCEPT EXPERIEMENT PHASE PRIOR TO
THE END OF THE DECADE. HE INDIACATED THAT THE US
GOAL FOR SOLAR POWER FOR THE YEAR 2020 IS TO
PROVIDE THE FOLLOWING (IN TERMS OF PROJECTED NEEDS):

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SS-15 AEC-11 SCEM-02 INT-08 PA-03 PRS-01 USIA-12

TRSE-00 SAJ-01 HEW-08 DOTE-00 HUD-02 OIC-04 ACDA-19

RSR-01 /227 W

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FM USMISSION NATO
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INFO ALL NATO CAPITALS 3121
AMEMBASSY CANBERRA
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A. 35 PCT OF US NEEDS IN HEATING AND COOLING OF BUILDINGS;

B. 30 PCT OF US NEEDS FOR GASEOUS FUELS;

C. 10PCT OF US NEEDS FOR LIQUID FUELS;

D. 20 PCT OF US NEEDS OF OUR ELECTRICAL NEEDS.

5. DR. HERWIG (NSF) STATED THAT THE OBJECTIVE OF THE NSF RESEARCH PROGRAM WAS SUPPORT OF ADVANCED RESEARCH AND TECHNOLOGY TO ACHIEVE THE EARLIEST POSSIBLE PRACTICAL UTILIZATION OF SOLAR ENERGY FOR LARGE-SCALE SUPPLEMENTATION OF NATIONAL AND WORLD

ENERGY RESOUCES. THIS EFFORT INCLUDES THE SUPPORT OF ADVANCED RESEARCH ON TECHNICAL PROBLEMS OF SOLAR SYSTEM COMPONENETS, SUBSYSTEMSS, AND MATERIALS; FEASIBILITY STUDIES OF SYSTEMS AND SUBSYSTEMS; SYSTEM MODELING, ANALYSIS AND OPTIMIZATION; COMPONENT AND SUBSYSTEM DEVELOPMENT AND TESTING. US SOLAR ENERGY PROGRAM INCLUDES APPLICATIONS IN HEATING AND COOLING OF BUILDINGS, SOLAR THERMAL ELECTRIC POWER GENERATIONS, PHOTOVOLTAICS, WIND, OCEAN TEMPERATURE DIFFERENCE CONVERSION PROCESSES, AND CONVERSION OF ORGANIC MATERIALS TO GASEOUS FUEL. A REVIEW OF THE NSF BUDGETS FOR SOLAR ENERGY RESEARCH FOR THE PAST THREE FISCAL YEARS WAS PRESENTED AND THE PROJECTS BEING SUPPORTED WERE SUMMARIZED IN EACH OF THE PRINCIPAL RESEARCH AREAS. THE NSF SOLAR ENERGY BUDGET HAS INCREASED FROM ABOUT ONE MILLION DOLLARS (1.0M.) IN FY 1971 TO 3.8M IN FY 1973. THE REQUESTED BUDGET FOR FY 1974 IS 12.2M. APPROXIMATELY

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30 RESEARCH PROJECTS ARE CURRENTLY UNDERWAY.

6. FIELDS (NSF) STATED THAT THE US GOVERNMENT (THROUGH NSF/RANN) HAS BEGUN A PROGRAM FOR HEATING AND COOLING OF BUILDINGS. PROPOSALS HAVE BEEN RECEIVED FROM INDUSTRY/UNIVERSITY TEAMS TO PERFORM 8-MONTH PHASE 0 STUDY TO IDENTIFY ECONOMICALLY VIABLE APPLICATIONS OF SOLAR ENERGY. ALL TYPES OF BUILDINGS IN ALL CLIMATIC AREAS OF THE UNITED STATES WILL BE STUDIED). THE PHASE I CONTRACTS INVOLVING PRELIMINARY DESIGN OF SELECTED CANDIDATE SYSTEMS AND SUPPORTING CRITICAL SUBSYSTEM RESEARCH WILL BE UNDERWAY BY THE END OF FY 1974. PHASE II, INVOLVING CONSTRUCTION AND TESTING OFPROOF OF CONCEPT EXPERIEMENTS WILL BE STARTED IN FY 1975 AND COMPLETED BY THE END OF FY 1976. EMPHASIS WILL BE PLACED ON DEVELOPING SYSTEMS POTENTIALLY ECONOMICALLY COMPETITIVE WITH FOSSIL FUEL BURNING SYSTEMS AND BUILDING RECOGNITION IN FINANCIAL, ARCHITECTURAL, AND CONSTRUCTION COMMUNITIES OF NEED FOR HIGHER INTIIAL COSTS TO ACHIEVE LOWER TOTAL LIFE-TIME COSTS.

7. FRANCE: FOLLOWING US PRESENTATIONS, FRANCE
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(ROBERT, ENGINEER, CNRS) GAVE GENERAL DESCRITION OF FRENCH SOLAR PROGRAM. ROBERT STATED THAT THERE WERE FOUR ORGANIZATIONS IN FRANCE INVOLVED IN SOLAR ENERGY FIELD: NATIONAL CENTER FOR SCIENTIFIC RESEARCH (CNRS), DEPARTMENT OF HELIOPHYSICS IN MARSEILLES, THE NATIONAL CENTER OF SPACE STUDIES, AND THE MARSEILLES LABORATORY OF PHOTOCHEMISTRY. FRENCH PROJECTS INCLUDE:
-SOLAR FURNACE AT ODEILLO;
-SOLAR HEATING AND COOLING OF BUILDINGS AT ODEILLO AND CHAUVENCY LE CHATEAU (NEAR METZ);

-FRESH WATER PUMPING USING SOLAR PUMPS (FOR UNDERDEVELOPED COUNTRIES) AND A SMALL EFFORT IN SOLAR REFRIGERATION (WHICH INCLUDES COLLABORATION WITH NIGER AND ICE PRODUCTION IN CHILI USING A NIGHT COLLING PROCESS).

ROBERT NOTED THAT THE WORK ON SOLAR HEATED HOUSES HAD BEGUN IN 1956. THREE EXPERIEMENTAL HOUSES WITH SOLAR COLLECTORS ON THE SOUTH WALL WERE COMPLETED AS A PART OF THE FIRST EXPERIEMENT; TWO OF THESE ARE PRESENTLY INHABITED. FRENCH USE PROCESS WHICH CALLS FOR AIR CONVECTION OVER THE HEATED CONCRETE SURFACE OF THE SOUTH WALL.

ODEILLO IS LOCATED AT 1500-METER ALTITUDE WITH

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AVERAGE WINTER TEMPERATURE RANGE OF 0-10 DEGREES C.
THE SOLAR HEATING ON THE SOUTH VERTICAL WALL IN
ODEILLO AREA WAS DESCRIBED BY ROBERT AS:
READ IN THREE COLUMNS

	THEORETICAL	OBSERVED
WINTER	7	6
SUMMER	1.5	3

VALUES ARE IN KWHR/SQUARE METER/DAY. ROBERT
REPORTED THAT SOLAR LOADING DURING SUMMER CAN BE
REDUCED BY GLASS PLACED IN FRONT OF COLLECTOR.

THE NORMAL HEATING REQUIREMENTS FOR SIMILAR
SIZED HOUSES IN THIS AREA IS 35 MEGAWATT-HOURS/YEAR;
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THE SOLAR HOUSES USE ONLY 10 MEGAWATTS-HOURS/YEAR OF
NON-SOLAR HEATING, THUS REDUCING ENERGY REQUIREMENTS
BY TWO-THIRDS. THE HOUSE IN CHAUVENCY LE CHATEAU
(WHERE THERE IS NOT AS MUCH SUN AS IN ODEILLO) IS
REPORTED TO SUSTAIN ENERGY SAVINGS OF 50 PERCENT.
IT IS INSTRUMENTED WITH THERMOCOUPLES IN THE WALL.
ROBERT ALSO NOTED THAT IN PARIS TWO OFFICE BUILDINGS
HAVE BEEN DESIGNED BY MICHEL AND CONSTRUCTED WITH
SOLAR COLLECTORS SIMILAR TO THOESE USED IN ODEILLO.

ROBERT REPORTS THAT CNRS IS PRESENTLY IN
PROCESS OF CONSTRUCTING THREE NEW SOLAR HOUSES
(HEATING AND COOLING) IN ODEILLO AREA WHICH WOULD
INCLUDE FOLLQOWING CHARACTERISTICS:

-SOLAR HEATING PANELS LOCATED ON SOUTH
VERTICAL WALL.

-WALL THICKNESS-40 CM (AS OPPOSED TO 60 CM
IN PREVIOUS PROJECT).

-HEIGHT OF WALL-3 METERS-TO PROVIDE
ADEQUATE NATURAL CIRCULATION OF AIR FROM
INSIDE HOUSE.

-EXTERNAL FACE PAINTED WITH SOLAR ABSORBENT
PAINT.

-ONE OR TWO PANES OF GLASS ARE PLACED ON
OUTISDE OF FACE WITH SPACERS TO ALLOW
NATURAL CIRCULATION.

-USE OF IMPROVED INSULATION ALLOWS PLACEMENT
OF SIX SQUARE METER DOOR AND WINDOWN AREAS ON
SOUTH SIDE OF HOUSE TO IMPROVE AESTHETICS.

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-THROUGH MODIFICATION OF RECIRCULATION PATTERN,
INTAKE OF AIR FROM NORTH SIDE OF HOUSE, AND
AN AIR COOLING RADIATOR USING WELL WATER,
SYSTEM ALSO PROVIDES SPACE COOLING.

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-CAPITAL COST OF WALL CONSTRUCTION IN SOLAR
HOME IS SOMEWHAT LESS (66.7-100 PCT) THAN CONVEN-
TIONAL WALL CONSTRUCTION.

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SS-15 AEC-11 SCEM-02 INT-08 PA-03 PRS-01 USIA-12

TRSE-00 SAJ-01 HEW-08 DOTE-00 HUD-02 OIC-04 ACDA-19

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INFO ALL NATO CAPITALS 3122
AMEMBASSY CANBERRA
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ROBERT REPORTS THAT NEW HOUSES WILL BE COMPLETED AND
INHABITED BY THE END OF 1974. ROBERT STATES THAT
CNRS WOULD BE DELIGHTED TO SHARE RESULTS OF NEW
SYSTEM AS PART OF CCMS PROJECT. ROBERT NOTED THAT
HOUSE DESIGN WAS PROTECTED BY PATENTS IN NAME OF
TROMBE AND MICHEL. ROBERT ALSO POINTED OUT THAT
IN FRANCE POWER MAY BE PURCHASED FOR 6 CENTIMES PER
KILOWATT HOUR AT NIGHT AND FOR 12 CENTIMES PER
KILOWATT HOUR IN THE DAY TIME.

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8. FRG: GANGOLF BRAUNLICH (BROWN-BOVERI
COMPANY, CONTRACTOR IN FRG FOR NEW TECHNOLOGY) GAVE
GERMAN PRESENTATION AS COMPANY REPRESENTATIVE. HE
STATED HW AS NOT REPEAT NOT ACTING AS OFFICIAL FRG
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REPRESENTATIVE. BROWN-BOVERI STUDY INDICATES THAT
SOLAR ENERGY CANNOT BE APPLIED AS MAJOR ALTERNATIVE
HEATING SOURCE IN LATITUDES GREATER THAN 40 DEGREES. GERMAN
STUDY IN HAMBURG SHOWED THAT THERE MAY B E SOME
POSSIBILITY OF USING SOLAR ENERGY IN PRIVATE HOUSES.
(FRENCH REPRESENTATIVE AT THAT POINT STATED THAT HE
DID NOT AGREE WITH FRG THAT IT WOULD BE IMPRACTICAL
TO USE SOLAR ENERGY IN GERMANY). BRAUNLICH RESPONDED
THAT IT MIGHT BE POSSIBLE TO USE SOLAR ENERGY IN
HOUSES, PARTICURLY IN SOUTHERN GERMANY, HAMBURG
PURPOSELY CHOSEN AS THE WORST POSSIBLE CASE IN WHICH
TO TEST THIS TECHNOLOGY. MOREOVER, SOLAR COLLECTORS
WAS PLACED IN HORIZONTAL PLANE WHICH NOT AS EFFICIENT
AS VERTICAL WALL COLLECTOR. THE HAMBURG STUDY DID
SHOW THAT THERE WOULD BE MINIMAL COST SAVINGS UNDER
CONDITIONS OUTLINED ABOVE. BRAUNLICH STATED THAT
THE FRG WOULD ONLY CONSIDER SOLAR ENERGY WHERE THE
COST OF INITIAL INSTALLMENT COULD BE AMORITIZED OVER
A 10 YEAR PERIOD. HE NOTED THAT A GERMAN ECONOMIC
STUDY ON THIS WOULD BE PRODUCED NEXT YEAR.

9. GREECE: DR. SPYRIDONOS REPORTED THAT GREEK
EFFORT IS PRIMARILY UNDER THE DIRECTION OF THE NUCLEAR
RESEARCH CENTER AT DEMOCRITIS. CENTER EMPHASIZES WORK
ON HOT WATER HEATERS AND SOLAR DISTILLATION. FIVE
SOLAR DISTILLATION PLANTS ARE IN OPERATION, INCLUDING
WHAT SPYRIDONOS CLAIMED TO BE THE LARGEST IN EUROPE.
WITH DEVELOPMENT BANK FUNDS, GREECE IS PLANNING TO
CONSTRUCT A LARGE SOLAR DISTILLATION PILOT PLANT ON
THE COAST (UNKNOWN LOCATION). ONE OBJECTIVE OF
RESEARCH EFFORT WOULD BE TO REDUCE COST OF SOLAR
DISTILLATION WHICH NOW COST 900 DRACHMA/SQUARE METER
TO 500 DRACHMA/SQUARE METER ($1.00 EQUAL 28 DRACHMA).
THE PROJECT WOULD ALSO INCLUDE WORK ON FLASH
DISTILLATION AND ELECTRODIALYSIS. SPYRIDONAS REPORTED
CRACKING PROBLEM WITH PLASTIC COVERS FOR SOLAR STILLS;
COVERS NOW USED ARE GLASS. NO RESEARCH ON PLASTICS
BEING PERFORMED IN GREECE. SYSTEM CONSTRUCTED THUS
FAR HAVE BEEN CONTRACTED WITH AMERICAN COMPANIES.
GOG DESIRE ESTABLISH NEW RESEARCH CENTER NEAR
SEASIDE LOCATION BUT THIS NOT YET BEGUM.
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10. PORTUGAL: DE SOUSA REPORTED PORTUGAL HAS NO SOLAR ENERGY PROGRAM AT THE CURRENT TIME. DE SOUSA INDICATED GOP INTEREST IN ENERGY CONSERVATION IN BUILDINGS. HE SAID NATIONAL LABORATORY FOR CIVIL ENGINEERING HAS SPECIAL BRANCH ON HOUSING PROBLEMS. DE SOUSA REPORTED THAT SPACE COMFORT IN PORTUGAL CAN IMPROVE SIGNIFICANTLY BY ORIENTING THE BUILDING TO FACILITATE UTILIZATION OF THE SUN AND USING ADEQUATE INSULATION. NATIONAL COUNCIL FOR SCIENTIFIC RESEARCH CONSIDERING ESTABLISHMENT OF COMMISSION ON ENERGY PROBLEMS.

1. UNITED KINGDOM: MR. HUMPHREYS REPORTED UK HAS NO ACTIVE SOLAR ENERGY PROGRAM. THEY ARE HOWEVER, INTERESTED (SIMILAR TO PORTUGAL) IN THE THERMODYNAMICS OF BUILDINGS, E.G., BLINDS, THERMAL INSULATIONS. THEY HAVE AN EXTENSIVE PROGRAM ON PLASTICS BEING USED AS BUILDING MATERIALS. IN PARTICULAR THEY ARE INVESTIGATING THE EFFECT OF ULTRAVIOLET LIGHT ON DEGRADATION OF PLASTIC BUILDING MATERIALS.

FOR ROME: DESPITE REPORT THAT TWO ITALIAN EXPERTS (ROME 6155) WOULD ATTEND MEETING, NEITHER SHOWED UP. WOULD APPRECIATE EMBASSY ROME'S ASCERTAINING WHAT HAPPENED AS THEIR PRESENCE AND POTENTIAL CONTRIBUTION WAS MISSED BY US DELEGATION. MCAULIFFE

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